

In the Claims

A complete listing of the claims is presented immediately hereinafter. Please amend Claims 110 and 112, as indicated:

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1-40. (previously canceled)

41. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a monitoring arrangement comprising:

a detection arrangement at said drill rig for monitoring at least one operational parameter to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool;

a portable device configured for movement by an individual operator for receiving the data signal relating to the operational parameter for use by the portable device and said portable device includes a display arrangement configured for using the data signal for display to the individual operator of the portable device; and

a communication arrangement for transferring the data signal from the drill rig to the portable device.

42. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore said boring tool including a locating signal transmitter which transmits a locating signal for locating an underground position of the boring tool, a monitoring arrangement comprising:

a detection arrangement at said drill rig for monitoring at least one operational parameter to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool;

a portable device configured for movement by an individual operator and for receiving the data signal relating to the operational parameter for use by the portable device and said portable device including a locating section for receiving the locating signal for use in identifying the underground position of the boring tool; and

a communication arrangement for transferring the data signal from the drill rig to the portable device.

43. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore and said drilling system includes a drill string extending from the drill rig to the boring tool configured for receiving a push force applied by the drill rig to move the boring tool in a forward direction, a monitoring arrangement comprising:

a detection arrangement at said drill rig for monitoring at least one operational parameter to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool;

a portable device configured for movement by an individual operator and configured for receiving the data signal relating to the operational parameter for use by the portable device;

a communication arrangement for transferring the data signal from the drill rig to the portable device; and

a push force sensing arrangement which generates a push force signal for inclusion as at least a portion of said data

signal.

44. (currently amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a monitoring arrangement comprising:

a detection arrangement at said drill rig for monitoring at least one operational parameter to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool and wherein said operational parameter is capable of violating at least a selected one of a minimum and a maximum predetermined value;

a portable device configured for movement by an individual operator and configured for receiving the data signal relating to the operational parameter for use by the portable device; and

a communication arrangement for transferring the data signal from the drill rig to the portable device and wherein said communication arrangement is configured for transferring, as part of said data signal, a warning to said portable device that the selected predetermined value has been violated.

45. (original) The monitoring arrangement of Claim 44 wherein said portable device is configured for providing at least a selected one of an audio indication and a visual indication in response to receipt of said warning.

46. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a monitoring arrangement comprising:

a detection arrangement at said drill rig for monitoring at least one operational parameter to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool and said operational parameter is capable of violating at least a selected one of a minimum and a maximum predetermined value;

a portable device configured for movement by an individual operator and configured for receiving the data signal relating to the operational parameter for use by the portable device and wherein said portable device is configured for issuing a warning that the selected predetermined value has been violated; and

a communication arrangement for transferring the data signal from the drill rig to the portable device.

47. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a monitoring arrangement comprising:

a detection arrangement at said drill rig for monitoring at least one operational parameter to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool and said operational parameter is a push force with which the boring tool is being pushed forward by the drill rig such that a maximum push value is established beyond which the boring tool may be damaged, said detection arrangement producing the data signal responsive to exceeding the maximum push value;

a portable device configured for movement by an individual operator and configured for receiving the data signal relating to the operational parameter for use by the portable device and further configured to provide an indication of

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violation of the maximum push value when the maximum push value is exceeded; and  
a communication arrangement for transferring the data signal from the drill rig to the portable device.

48. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore and said boring tool uses drilling mud provided from said drill rig, a monitoring arrangement comprising:

a detection arrangement at said drill rig for monitoring at least one operational parameter to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool and wherein said operational parameter is a status of the drilling mud for inclusion as at least a portion of said data signal;

a portable device configured for movement by an individual operator and configured for receiving the data signal relating to the operational parameter for use by the portable device; and

a communication arrangement for transferring the data signal from the drill rig to the portable device.

49. (original) The monitoring arrangement of Claim 48 wherein said portable device is configured to provide an operator warning based on the status of said drilling mud.

50. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore and said boring tool is attached to and moved by a drill string having one minimum bend radius and extending from the drill rig and a utility to be installed includes another minimum bend radius, a monitoring arrangement comprising:

a detection arrangement at said drill rig for monitoring at least one operational parameter to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool and wherein said detection arrangement at the drill rig includes a drill path monitoring arrangement for monitoring curvature of the underground bore being formed by the boring tool as said operational parameter and for comparing at least a selected one of the minimum bend radius of the drill string and the minimum bend radius of the utility with the curvature of the underground bore to form at least a portion of said data signal;

a portable device configured for movement by an individual operator and configured for receiving the data signal relating to the operational parameter for use by the portable device; and

a communication arrangement for transferring the data signal from the drill rig to the portable device.

51. (original) The monitoring arrangement of Claim 50 wherein said portable device is configured for indicating that the selected minimum bend radius is being violated.

52. (original) The monitoring arrangement of Claim 51 wherein the selected minimum bend radius is a greater one of the minimum bend radius of the drill string and the minimum bend radius of the utility and the portable device is configured to provide an indication of violation of the greater minimum bend radius.

53-54. (previously canceled)

55. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a method comprising the steps of:

monitoring at least one operational parameter using a detection arrangement at said drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool;

transferring the data signal, relating to the operational parameter, to a portable device, that is configured for movement by an individual operator, for use by the portable device which includes a display arrangement; and

using the data signal for a display presentation to the individual operator of the portable device.

56. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore and said boring tool includes a locating signal transmitter which transmits a locating signal for locating an underground position of the boring tool, a method comprising the steps of:

monitoring at least one operational parameter using a detection arrangement at said drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool;

transferring the data signal, relating to the operational parameter, to a portable device for use by the portable device; and

configuring the portable device for movement by an individual operator and for receiving the locating signal for use in identifying the underground position of the boring tool.

57. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore and said drilling system includes a drill string extending from the drill rig to the boring tool configured for receiving a push force applied by the drill rig to move the boring tool in a forward direction, a method comprising the steps of:

monitoring at least one operational parameter using a detection arrangement at said drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool and sensing the push force to generate a push force signal for inclusion as at least a portion of said data signal; and

transferring the data signal, relating to the operational parameter, to a portable device that is configured for movement by an individual operator for use by the portable device.

58. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a method comprising the steps of:

monitoring at least one operational parameter using a detection arrangement at said drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool and said operational parameter is capable of violating at least a selected one of a minimum and a maximum predetermined value;

transferring the data signal, relating to the operational parameter, to a portable device that is configured for movement by an individual operator for use by the portable device and sending, as at least a portion of said data signal, a warning to said portable device that the selected predetermined value has been violated.

59. (original) The method of Claim 58 including the step of indicating receipt of said warning at the portable device using at least a selected one of an audio indication and a visual indication.

60. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a method comprising the steps of:

monitoring at least one operational parameter using a detection arrangement at said drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool and said operational parameter is capable of violating at least a selected one of a minimum and a maximum predetermined value;

transferring the data signal, relating to the operational parameter, to a portable device, that is configured for movement by an individual operator thereof, for use by the portable device; and

issuing a warning, using said portable device, that the selected predetermined value has been violated.

61. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a method comprising the steps of:

monitoring at least one operational parameter using a detection arrangement at said drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool and said operational parameter is a push force with which the boring tool is being pushed forward by the drill rig such that a maximum push value is established beyond which the boring tool will be damaged; and

transferring the data signal, relating to the operational parameter, to a portable device, that is configured for movement by an individual operator thereof, for use by the portable device responsive to violation of the maximum push value when the maximum push value is exceeded.

62. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore and said boring tool uses drilling mud provided from said drill rig, a method comprising the steps of:

monitoring at least one operational parameter using a detection arrangement at said drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool as a status of the drilling mud for inclusion as at least a portion of said data signal; and

transferring the data signal, relating to the operational parameter, to a portable device, that is configured for movement by an individual operator thereof, for use by the portable device.

63. (previously amended) The method of Claim 62 including the step of issuing an operator warning using the

portable device based on the status of said drilling mud.

64. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore and said boring tool is attached to and moved by a drill string having one minimum bend radius and extending from the drill rig and a utility to be installed includes another minimum bend radius, a method comprising the steps of:

monitoring at least one operational parameter using a detection arrangement at said drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool as curvature of the underground bore being formed by the boring tool;

transferring the data signal, relating to the operational parameter, to a portable device, that is configured for movement by an individual operator thereof, for use by the portable device; and

comparing at least a selected one of the minimum bend radius of the drill string and the minimum bend radius of the utility with the curvature of the underground bore to form at least a portion of said data signal.

65. (original) The method of Claim 64 including the step of using the portable device to indicate that the selected minimum bend radius is being violated.

66. (original) The method of Claim 64 including the steps of selecting the minimum bend radius as a greater one of the minimum bend radius of the drill string and the minimum bend radius of the utility and configuring the portable device to provide an indication of violation of the greater minimum bend radius.

67-68. (previously canceled)

69. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a monitoring arrangement comprising:

a detection arrangement for monitoring at least one operational parameter which is at least measurable at the drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool;

a portable device configured for movement by an individual operator thereof and for receiving the data signal relating to the operational parameter for use by the portable device and which includes a display arrangement configured for using the data signal for display to the individual operator of the portable device; and

a communication arrangement for transferring the data signal from the detection arrangement to the portable device.

70. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore and said boring tool includes a locating signal transmitter which transmits a locating signal for locating an underground position of the boring tool, a monitoring arrangement comprising:

a detection arrangement for monitoring at least one operational parameter which is at least measurable at the drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool;

a portable device configured for movement by an individual operator thereof and for receiving the data signal relating to the operational parameter for use by the portable device and which includes a locating section for receiving the locating signal for use in identifying the underground position of the boring tool; and

a communication arrangement for transferring the data signal from the detection arrangement to the portable device.

71. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore and said drilling system includes a drill string extending from the drill rig to the boring tool configured for receiving a push force applied by the drill rig to move the boring tool in a forward direction, a monitoring arrangement comprising:

a detection arrangement for monitoring at least one operational parameter which is at least measurable at the drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool and which generates a push force signal for inclusion as at least a portion of said data signal;

a portable device configured for movement by an individual operator thereof and for receiving the data signal relating to the operational parameter for use by the portable device; and

a communication arrangement for transferring the data signal from the detection arrangement to the portable device.

72. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a monitoring arrangement comprising:

a detection arrangement for monitoring at least one operational parameter which is at least measurable at the drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool and said operational parameter is capable of violating at least a selected one of a minimum and maximum predetermined value;

a portable device configured for movement by an individual operator thereof and for receiving the data signal relating to the operational parameter for use by the portable device; and

a communication arrangement for transferring the data signal from the detection arrangement to the portable device and configured for transferring, as part of said data signal, a warning to said portable device that said predetermined value has been violated.

73. (original) monitoring arrangement of Claim 72 wherein said portable device is configured for providing at least a selected one of an audio indication and a visual indication in response to receipt of said warning.

74. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a monitoring arrangement comprising:

a detection arrangement for monitoring at least one operational parameter which is at least measurable at the drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool and said operational parameter is capable of violating at least a selected one of a minimum and maximum predetermined value;

a portable device configured for movement by an individual operator thereof and for receiving the data signal relating to the operational parameter for use by the portable device and configured for issuing a warning that the selected predetermined value has been violated; and

a communication arrangement for transferring the data signal from the detection arrangement to the portable device.

75. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a monitoring arrangement comprising:

a detection arrangement for monitoring at least one operational parameter which is at least measurable at the drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool and said operational parameter is a push force with which the boring tool is being pushed forward by the drill rig such that a maximum push value is established beyond which the boring tool may be damaged, said detection arrangement producing the data signal responsive to exceeding the maximum push value;

a portable device configured for movement by an individual operator thereof and for receiving the data signal relating to the operational parameter for use by the portable device and configured to provide an indication of violation of the maximum push value when the maximum push value is exceeded; and

a communication arrangement for transferring the data signal from the detection arrangement to the portable device.

76. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore and said boring tool uses drilling mud provided from said drill rig, a monitoring arrangement comprising:

a detection arrangement for monitoring at least one operational parameter which is at least measurable at the drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool and wherein said operational parameter is a status of the drilling mud for inclusion as at least a portion of said data signal;

a portable device configured for movement by an individual operator thereof and for receiving the data signal relating to the operational parameter for use by the portable device; and

a communication arrangement for transferring the data signal from the detection arrangement to the portable device.

77. (original) The monitoring arrangement of Claim 76 wherein said portable device is configured to provide an operator warning based on the status of said drilling mud.

78. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore and said



boring tool is attached to and moved by a drill string having one minimum bend radius and extending from the drill rig and a utility to be installed includes another minimum bend radius, a monitoring arrangement comprising:

a detection arrangement for monitoring at least one operational parameter which is at least measurable at the drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool and which detection arrangement at the drill rig includes a drill path monitoring arrangement for monitoring curvature of the underground bore being formed by the boring tool as said operational parameter and for comparing at least a selected one of the minimum bend radius of the drill string and the minimum bend radius of the utility with the curvature of the underground bore to form at least a portion of said data signal;

a portable device configured for movement by an individual operator thereof and for receiving the data signal relating to the operational parameter for use by the portable device; and

a communication arrangement for transferring the data signal from the detection arrangement to the portable device.

79. (original) The monitoring arrangement of Claim 78 wherein said portable device is configured for indicating that the selected minimum bend radius is being violated.

80. (original) The monitoring arrangement of Claim 79 wherein the selected minimum bend radius is a greater one of the minimum bend radius of the drill string and the minimum bend radius of the utility and the portable device is configured to provide an indication of violation of the greater minimum bend radius.

81-82. (previously canceled)

83. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a method comprising the steps of:

monitoring at least one operational parameter which is at least measurable at said drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool; and

transferring the data signal, relating to the operational parameter, to a portable device, that is configured for movement by an individual operator thereof, for use by the portable device, which includes a display arrangement; and using the data signal for a display presentation to the individual operator of the portable device.

84. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore and said boring tool includes a locating signal transmitter which transmits a locating signal for locating an underground position of the boring tool, a method comprising the steps of:

monitoring at least one operational parameter which is at least measurable at said drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool;

transferring the data signal, relating to the operational parameter, to a portable device, for use by the portable device; and

configuring the portable device for movement by an individual operator thereof and for receiving the locating signal for use in identifying the underground position of the boring tool.

85. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore and said drilling system includes a drill string extending from the drill rig to the boring tool configured for receiving a push force applied by the drill rig to move the boring tool in a forward direction, a method comprising the steps of:

monitoring at least one operational parameter which is at least measurable at said drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool and for sensing the push force to generate a push force signal for inclusion as at least a portion of said data signal; and

transferring the data signal, relating to the operational parameter, to a portable device, that is configured for movement by an individual operator thereof, for use by the portable device.

86. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a method comprising the steps of:

monitoring at least one operational parameter which is at least measurable at said drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool and said operational parameter is capable of violating a minimum or maximum predetermined value; and

transferring the data signal, relating to the operational parameter, to a portable device, that is configured for movement by an individual operator thereof, for use by the portable device and sending, as at least a portion of said data signal, a warning to said portable device that said predetermined value has been violated.

87. (original) The method of Claim 86 including the step of indicating receipt of said warning at the portable device using at least a selected one of an audio indication and a visual indication.

88. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a method comprising the steps of:

monitoring at least one operational parameter which is at least measurable at said drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool and said operational parameter is capable of violating a minimum or maximum predetermined value; and

transferring the data signal, relating to the operational parameter, to a portable device, that is configured for movement by an individual operator thereof, for use by the portable device; and

issuing a warning, using said portable device, that the selected predetermined value has been violated.

89. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a method

comprising the steps of:

monitoring at least one operational parameter which is at least measurable at said drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool and said operational parameter is a push force with which the boring tool is being pushed forward by the drill rig such that a maximum push value is established beyond which the boring tool will be damaged; and

transferring the data signal, relating to the operational parameter, to a portable device, that is configured for movement by an individual operator thereof, for use by the portable device responsive to violation of the maximum push value when the maximum push value is exceeded.

90. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore and said boring tool uses drilling mud provided from said drill rig, a method comprising the steps of:

monitoring at least one operational parameter which is at least measurable at said drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool as a status of the drilling mud for inclusion as at least a portion of said data signal; and

transferring the data signal, relating to the operational parameter, to a portable device, that is configured for movement by an individual operator thereof, for use by the portable device.

91. (previously amended) The method of Claim 90 including the step of issuing an operator warning using the portable device based on the status of said drilling mud.

92. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore and said boring tool is attached to and moved by a drill string having one minimum bend radius and extending from the drill rig and a utility to be installed includes another minimum bend radius, a method comprising the steps of:

monitoring at least one operational parameter which is at least measurable at said drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool as curvature of the underground bore being formed by the boring tool;

comparing at least a selected one of the minimum bend radius of the drill string and the minimum bend radius of the utility with the curvature of the underground bore to form at least a portion of said data signal; and

transferring the data signal, relating to the operational parameter, to a portable device, that is configured for movement by an individual operator thereof, for use by the portable device.

93. (original) The method of Claim 92 including the step of using the portable device to indicate that the selected minimum bend radius is being violated.

94. (original) The method of Claim 93 including the steps of selecting the minimum bend radius as a greater one of the minimum bend radius of the drill string and the minimum bend radius of the utility and configuring the portable device to

provide an indication of violation of the greater minimum bend radius.

95-96. (previously canceled)

97. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a monitoring arrangement comprising:

a detection arrangement at said drill rig for monitoring at least one operational parameter to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool and said detection arrangement is configured for detecting a range of the operational parameter for which an out of range condition of the operational parameter can result in a catastrophic equipment failure;

a portable device configured for movement by an individual operator thereof and for receiving the data signal relating to the operational parameter for use by the portable device; and

a communication arrangement for transferring the data signal from the drill rig to the portable device.

98. (previously amended) The monitoring arrangement of Claim 97 wherein the detection arrangement is further configured for detecting the operational parameter as at least one of a push force which drives the boring tool, a temperature of the boring tool, a pressure of a drilling mud that is supplied to the boring tool, a status of a battery used in the boring tool, a curvature of the underground bore and a proximity of the boring tool to an underground utility.

99. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a method comprising the steps of:

monitoring at least one operational parameter using a detection arrangement at said drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool to detect a range of the operational parameter for which an out of range condition of the operational parameter can result in a catastrophic equipment failure; and

transferring the data signal, relating to the operational parameter, to a portable device, that is configured for movement by an individual operator thereof, for use by the portable device.

100. (previously added) The method of Claim 99 including the step of detecting the operational parameter as at least one of a push force which drives the boring tool, a temperature of the boring tool, a pressure of a drilling mud that is supplied to the boring tool, a status of a battery used in the boring tool, a curvature of the underground bore and a proximity of the boring tool to an underground utility.

101. (previously added) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a monitoring arrangement comprising:

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a detection arrangement for monitoring at least one operational parameter which is at least measurable at the drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool and configured for detecting a range of the operational parameter for which an out of range condition of the operational parameter can result in a catastrophic equipment failure;

a portable device configured for movement by an individual operator thereof and for receiving the data signal relating to the operational parameter for use by the portable device; and

a communication arrangement for transferring the data signal from the detection arrangement to the portable device.

102. (previously added) The monitoring arrangement of Claim 101 wherein the detection arrangement is further configured for detecting the operational parameter as at least one of a push force which drives the boring tool, a temperature of the boring tool, a pressure of a drilling mud that is supplied to the boring tool, a status of a battery used in the boring tool, a curvature of the underground bore and a proximity of the boring tool to an underground utility.

103. (previously amended) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a method comprising the steps of:

monitoring at least one operational parameter which is at least measurable at said drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool for detecting a range of the operational parameter for which an out of range condition of the operational parameter can result in a catastrophic equipment failure; and

transferring the data signal, relating to the operational parameter, to a portable device, that is configured for movement by an individual operator thereof, for use by the portable device.

104. (previously added) The method of Claim 103 including the step of detecting the operational parameter as at least one of a push force which drives the boring tool, a temperature of the boring tool, a pressure of a drilling mud that is supplied to the boring tool, a status of a battery used in the boring tool and a proximity of the boring tool to an underground utility.

105. (previously added) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a monitoring arrangement comprising:

a detection arrangement at said drill rig for monitoring at least one operational parameter to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool;

a portable device configured for movement by an individual operator thereof and for receiving the data signal relating to the operational parameter for use by the portable device; and

a communication arrangement for transferring the data signal from the drill rig to the portable device.

106. (previously added) The monitoring arrangement of Claim 105 wherein said communication arrangement

includes a telemetry link between the detection arrangement at the drill rig and the portable device for transferring the data signal to the portable device.

107. (previously added) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a method comprising:

monitoring at least one operational parameter using a detection arrangement at said drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool; and

transferring the data signal, relating to the operational parameter, to a portable device, that is configured for movement by an individual operator thereof, for use by the portable device.

108. (previously added) The method of Claim 107 including the step of providing a telemetry link between the detection arrangement at the drill rig and the portable device and said transferring step includes the step of using the telemetry link for transmitting the data signal to the portable device.

109. (previously added) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a monitoring arrangement comprising:

a detection arrangement for monitoring at least one operational parameter which is at least measurable at the drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool;

a portable device configured for movement by an individual operator thereof and for receiving the data signal relating to the operational parameter for use by the portable device; and

a communication arrangement for transferring the data signal from the detection arrangement to the portable device.

110. (currently amended) The monitoring arrangement of Claim 108 ~~109~~ wherein said communication arrangement includes a telemetry link between the detection arrangement at the drill rig and the portable device for transferring the data signal to the portable device.

111. (previously added) In a drilling system for performing underground boring including a drill rig and a boring tool which is configured for moving through the ground under control of the drill rig to form an underground bore, a method comprising:

monitoring at least one operational parameter which is at least measurable at said drill rig to produce a data signal relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool; and

transferring the data signal, relating to the operational parameter, to a portable device, that is configured for movement by an individual operator thereof, for use by the portable device.

112. (currently amended) The method of Claim ~~110~~ 111 including the step of providing a telemetry link between

the detection arrangement at the drill rig and the portable device and said transferring step includes the step of using the telemetry link for transmitting the data signal to the portable device.

113. (previously added) In a drilling system for performing an underground boring operation including a drill rig and a boring tool which is configured for moving through the ground using a drill string which extends from the drill rig to the boring tool such that the underground boring operation forms an underground bore, a monitoring arrangement comprising:

a first arrangement for transferring at least one operational parameter through the drill string from the boring tool to the drill rig, said operational parameter relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool; and

a second arrangement, at least partially located at said drill rig, for receiving the parameter from the drill string and for transmitting the operational parameter; and

a portable device configured for movement by an individual operator thereof and at least for receiving the operational parameter as transmitted by the second arrangement for use by the portable device.

114. (previously added) In a drilling system for performing an underground boring operation including a drill rig and a boring tool which is configured for moving through the ground using a drill string which extends from the drill rig to the boring tool such that the underground boring operation forms an underground bore, a method comprising the steps of:

transferring at least one operational parameter through the drill string from the boring tool to the drill rig, said operational parameter relating to at least one of a utility to be installed in the underground bore, the drill rig and the boring tool; and

transmitting a data signal, relating at least to the operational parameter as received, from the drill rig to a portable device, that is configured for movement by an individual operator thereof, for use by the portable device.

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